

Proposed Abstract:

The phase-shifting point diffraction interferometer (PS/PDI) was developed to address the problem of at-wavelength metrology of extreme ultraviolet (EUV) optical systems. Although extremely accurate, the fact that the PS/PDI is limited to use with coherent EUV sources, such as undulator radiation, is a drawback for its widespread use. An alternative to the PS/PDI, with relaxed coherence requirements, is lateral shearing interferometry (LSI). The use of a cross-grating, carrier-frequency configuration to characterize a large-field 4x-reduction EUV lithography optic is demonstrated. The results obtained are directly compared with PS/PDI measurements. A defocused implementation of the lateral shearing interferometer in which an image-plane filter allows both phase-shifting and Fourier wavefront recovery. The two wavefront recovery methods can be combined in a dual-domain technique providing suppression of noise added by self-interference of high-frequency components in the test-optic wavefront.